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09/407,430	09/29/99	WORMAN H	0575/54805

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EXAMINER	
NGUYEN, Q	
ART UNIT	**PAPER NUMBER**
1632	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

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1- File Copy

Office Action Summary	Application N .	Applicant(s)	
	09/407,430	WORMAN ET AL.	
	Examiner	Art Unit	
	Quang Nguyen	1632	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 January 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *12-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election **with traverse** of Group I (claims 1-11) in Paper No. 9 is acknowledged. The traversal is on the ground(s) that the inventions of Groups I, II and III are not independent inventions and that there is no serious burden on the Examiner to examine the entire application. This is not found persuasive for the following reasons:

The invention of Group I is drawn to a method of treating or preventing hepatitis C virus infection in a subject, whereas the invention of Group II is directed to a method of identifying a compound which can inhibit the attachment of hepatitis C virus onto cells by inhibiting the binding of hepatitis C virus envelope E2 protein to a cellular protein associated with hepatitis C virus attachment onto cells and their entry into cells. The methods in Groups I and II involves different starting materials (non-therapeutically effective materials for the method of Group II), different processing steps (comparison steps in the method of Group II), and different technical considerations in light of different endpoint results (therapeutic results ranging from slowing to stopping the progression of hepatitis C infection as well as preventing hepatitis C infection in a subject for the method of Group I, whereas such therapeutic results are not required for the method of Group II). The invention of Group III is directed to a compound or a composition comprising a compound that is capable of inhibiting the interactions between hepatitis C virus envelope E2 protein and a cellular protein associated with

hepatitis C virus attachment onto cells and their entry into cells, can be used in either the method of Group I or the method of Group II.

With respect to undue burden to the Examiner, the above inventions acquired separate search status as shown by their different classification, and their divergent subject matters as discussed in the preceding paragraph. Therefore, the search for claims in one Group is not necessarily overlapped with searches for claims of other Groups.

The requirement is still deemed proper and is therefore made **FINAL**.

Claims 1-11 are examined on the merits herein.

Specification

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 250 words. It is important that the abstract not exceed 250 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "**said**," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Appropriate correction is required.

Writt n Description

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Vas-Cath Inc. v. Mahurkar, 19USPQ2d 1111 (Fed. Cir. 1991), clearly states that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*. The invention is, for purposes of the 'written description' inquiry, *whatever is now claimed.*" Vas-Cath Inc. v. Mahurkar, 19USPQ2d at 1117. The specification does not "clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed."Vas-Cath Inc. v. Mahurkar, 19USPQ2d at 1116.

Applicant's invention is drawn to a method of treating or preventing hepatitis C virus (HCV) infection in a subject using an effective amount of **an agent** that is capable of inhibiting the attachment of hepatitis C virus onto cells by specifically binding to the hepatitis C virus envelope E2 protein, wherein the agent is a polypeptide, a pseudo enzyme, a peptidomimetic compound, a nucleic acid, an antibody or its variant thereof. In analyzing whether the required written description is met for genus claims, it is first determined whether a representative number of species has been described by their complete structure. The instant specification teaches that a portion of a protein of

unknown function that has a sequence of SEQ ID NO: 1, and called E_o protein in the present application, and its fragment containing the amino acid sequence of residues 1-120 of SEQ ID NO:1 are capable of interacting with a portion of hepatitis C virus envelope protein E2, as indicated by results derived from the yeast two-hybrid assay. However, the specification fails to disclose any pseudo enzyme or any peptidomimetic compound or any nucleic acid that are capable of interacting with a portion of hepatitis C virus envelope protein E2, and thereby inhibiting the attachment of hepatitis C virus envelope E2 protein onto cells so as to treat or prevent hepatitis C virus in the method as claimed. Nor does the prior art at the effective filing date of the present application provide such teachings. Next, it is determined whether a representative number of species has been described by other relevant identifying characteristics. Apart from the common functional activity of inhibiting the attachment of heptatitis C virus onto cells, the specification fails to disclose any other relevant structural characteristics among polypeptides, among peptidomimetic compounds, among nucleic acid molecules, among antibodies or their variants; and between each of the class of the molecules encompassed by the term "agent". The claimed invention as a whole is not adequately described if the claims require essential or critical elements which are not adequately described in the claims require essential or critical elements which are not adequately described in the specification and which are not conventional in the art as of Applicants' filing date. Possession may be shown by actual reduction to practice, clear depiction of the invention in a detailed drawing, or by describing the invention with sufficient relevant identifying characteristics such that a person skilled in the art would recognize that the

inventor had possession of the claimed invention. Pfaff v. Wells Electronics, Inc., 48 USPQ2d 1641, 1646 (1998). The skilled artisan cannot envision the detailed structure of the claimed a pseudo enzyme, a peptidomimetic compound or a nucleic acid that are capable of inhibiting the attachment of hepatitis C onto cells, other than the E_o protein and its fragment containing the amino acid sequence of residues 1-120, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. See *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016 (Fed. Cir. 1991). One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481, 1483.

Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision (see page 1115).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable

one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The factors to be considered in the determination of an enabling disclosure have been summarized as the quantity of experimentation necessary, the amount of direction or guidance presented, the state of the prior art, the relative skill of those in the art, the predictability or unpredictability of the art and the breadth of the claims. *Ex parte Forman*, (230 USPQ 546 (Bd Pat. Appl & Unt, 1986); *In re Wands*, 858 F.2d 731, 8 USPQ 2d 1400 (Fed. Cir. 1988)).

The claims are directed to a method of treating or preventing hepatitis C virus (HCV) infection in a subject comprising administering an effective amount of an agent to the subject, wherein the agent is capable of inhibiting the attachment of hepatitis C virus onto cells and thereby to treat or prevent hepatitis C virus infection, and wherein the agent is a polypeptide (preferably E_o protein or its variant or more preferably SEQ ID NO: 1 or E_o1 protein having amino acids 1-120 of SEQ ID NO:1), a pseudo enzyme, a peptidomimetic compound, a nucleic acid, an antibody or its variant thereof. The claims are also drawn to the same method wherein the hepatitis C virus envelope E2 protein comprises amino acid sequence of SEQ ID NO:2, or comprises 254 amino acids of SEQ ID NO:2 or comprises amino acid sequence of SEQ ID NO:3.

The specification teaches by exemplification that using the yeast two hybrid assay, two clones encoding a portion of a protein were selected from a library of human liver Matchmaker cDNA for interacting with a portion of hepatitis C virus E2 lacking its most hydrophobic, carboxyl terminal domain. The sequence of the encoded portion of a

protein is referred to as E_o protein having the amino acid sequence of SEQ ID NO:1. Furthermore, the specification teaches that the encoded amino acid sequence containing amino acid residues 1-120 of SEQ ID NO:1 (or E_o1 protein) is also capable of binding to the portion of hepatitis C virus E2 as does the E_o protein, although at a relatively weaker binding affinity (See specification, pages 18-20).

The above evidence has been noted and considered. However, the evidence can not be extrapolated to the instant claimed invention which is drawn to a method of treating or preventing hepatitis C virus infection in a subject using an agent that is capable of inhibiting the attachment of hepatitis C virus onto cells, with the broad claims encompass an agent that includes a polypeptide, a pseudo enzyme, a peptidomimetic compound, a nucleic acid, an antibody or its variant thereof.

The instant specification is not enabled for the claimed invention because it fails to provide any guidance regarding the use of any agent, whether it is a polypeptide, a pseudoenzyme, a peptidomimetic compound, a nucleic acid or an antibody or its variant, that is capable of inhibiting the attachment of heptatitis C virus onto cells to treat or prevent hepatitis C virus infection in a subject. The specification fails to teach or demonstrate a correlation between the binding interaction of the E_o and E_o1 proteins with a portion of the hepatitis C virus E2 envelope protein observed via the yeast two hybrid assay with any of the therapeutic effects contemplated by the claimed invention which comprise the inhibition of HCV replication, stopping or delaying the progression of liver disease in a subject. Since the prior art at the filing date of the present application does not provide such guidance, it is incumbent upon the instant specification to do so.

At the filing date of the present application, standard treatments for patients infected with hepatitis C include therapies using recombinant alpha interferon alone or in combination with the nucleoside analogue Ribavirin, whose actions are not mediated via inhibiting the attachment of hepatitis C virus onto cells (Gish, Seminars in liver disease 19 (S1): 35-47, 1999). Moreover, the physiological art is recognized as unpredictable (MPEP 2164.03). As set forth in *In re Fisher*, 166 USPQ 18 (CCPA 1970), compliance with 35 USC 112, first paragraph requires:

> That scope of claims must bear a reasonable correlation to scope of enablement provided by specification to persons of ordinary skill in the are; in cases involving predictable factors, such as mechanical or electrical elements, a single embodiment provides broad enablement in the sense that, once imagined, other embodiments can be made without difficulty and their performance characteristics predicted by resort to known scientific laws; in cases involving unpredictagle factors, such as most chemical reactions and physiological activity, scope of enablement varies inversely with degree of unpredictability of factors involved.

Therefore, with the lack of guidance provided by the instant specification, it would have required undue experimentation without a predictable expectation of success for one skilled in the art to make and use the claimed invention.

With regard to broad claims encompassing the use of **any and all polypeptide** that is capable of inhibiting the attachment of hepatitis C virus onto cells for the treatment or prevention of hepatitis C virus infection in a subject via any and all routes of administering into the subject, the specification fails to provide any specific relevant information regarding to the effective amount of the polypeptide used, the route of delivery utilized, the specific regimens deployed such that a therapeutic effect could be achieved in a subject as claimed. Apart from the disclosure in the instant specification that E_o and E_o1 proteins are capable of binding to a portion of the hepatitis C virus E2 envelope protein, it is also known in the art that other polypeptides such as the CD81

protein (Abrignani et al., WO 99/18198; see page 2, lines 18-25), annexin V, tubulin, apolipoprotein B (Maertens et al., WO 99/24054; see abstract), as well as endogenous host proteins such as the chaperone protein calnexin and lactoferrin are capable of binding at least to the hepatitis C virus envelope protein E2 (Maertens et al., WO 99/24054; page 2, lines 12-29). However, the potential therapeutic values of these proteins for treating or preventing HCV infection in a subject remain to be determined or investigated because the mechanism by which HCV enters target cells remains unknown (Flint et al., J. Virol. 73:6782-67900, 1999; page 6782, column 2, last three lines) and the exact role of HCV envelope proteins E1 and E2 has not yet been elucidated (Maertens et al., WO 99/24054; page 2, lines 12-14). Flint et al. also stated that "Clearly, it will be important to demonstrate whether CD81, either alone or with additional factors, can function as the HCV receptor in allowing pseudotyped virus-cell attachment and entry. **Since CD81 is so widely expressed, it is unlikely to be the sole factor determining HCV liver tropism**" (page 6789, column 1 lines 1-6). With respect to the use of the E_o, E_o1 proteins and their variants in the method as claimed, it is still unclear whether these proteins are still capable of exhibiting a binding affinity for the full-length E2 envelope protein presented on the surface of the hepatitis C virus, usually in complexes with other viral envelope components, such as the E1 envelope protein. Additionally, it is unclear whether the affinity is strong enough to compete efficiently with the putative cellular receptor(s) of HCV and thereby inhibiting the attachment of HCV onto target cells. Gish noted that the standard management of chronic HCV infection is complicated by various factors, including: the rapid mutation

rate of the HCV genome, particularly the hypervariable region, the lack of neutralizing antibodies to HCV gene products, and the lack of sequence homology (less than 72%) among various subtypes of HCV (page 36, column 1, first full paragraph, line 8 continues to the first paragraph on column 2). It is thought that the binding of E2 to target cells mostly involves the highly variable amino terminus of E2, the hypervariable region I (Maertens et al., WO 99/24054; page 2, lines 12-17). In view of this, it is further unclear whether the disclosed E_o, E_o1 proteins are still capable of binding efficiently *in vivo* to the highly variable region of E2 in any and all HCV subtypes such that to inhibit attachment of HCV to putative cellular receptors and thereby treating and preventing HCV infection in a subject. Therefore, given the complete lack of guidance provided by the instant specification regarding to the effective *in vivo* use for any polypeptide that is capable of binding HCV envelope E2 protein, let alone any and all agent as encompassed by broad claims, for treating or preventing HCV infection in a subject, it would have required undue experimentation without a predictable expectation of success for a skilled artisan to make and use the claimed invention. As noted above, the instant claims encompass any and all variants of E_o and E_o1 proteins. However, the instant specification offers no guidance as to which region of the E_o or E_o1 protein would be tolerant to alteration and which would not, which "particular" amino acid changes (substitution, deletion or insertion) at which position and at which combinations, such that the variant proteins still possess the ability to bind to HCV E2 protein. It is well recognized in the art, any modification (even a "conservative" substitution) to a critical region of a protein is likely to significantly alter its functional properties. Therefore, there

is a high degree of unpredictability associated with the make and use of the claimed embodiment. For examples, in discussing peptide hormones, Rudinger has stated that "The significance of particular amino acids and sequences for different aspects of biological activity can not be predicted a priori but must be determined from case to case by painstaking experimental study (Page 6, first sentence of Conclusions *In* J.A. Parsons, ed. "Peptide hormones", University Park Press, 1976). This unpredictability is further underscored by the fact that the relationship between the sequence of a peptide and its tertiary structure (or its activity), for this instance the ability to bind to HCV E2 protein, is not well understood and is not predictable (Ngo et al., *In* K. Merz et al., ed. "The protein folding problem and tertiary structure prediction", Birkhauser, 1994, 491-495). Again, in the absence of any guidance provided by the instant specification showing the effectiveness of any E_o or E_o1 variant protein in treating or preventing HCV infection in a subject, it would have required undue experimentation without a predictable expectation of success for one skilled in the art to make and use the instantly claimed invention. Also noted above that the claims encompass any and routes of administering the polypeptide into a subject for the claimed method. However, the instant specification fails to provide any relevant information regarding to the *in vivo* stability of the polypeptide utilized or how to overcome random degradation of the administered polypeptide in a treated host and more importantly how to target the polypeptide to a desired tissue or organ that is infected with HCV in an effective amount by any and all means of delivery such that a therapeutic effect could be attained in the method as claimed. Again, in the absence of any guidance provided by the instant

specification, it would have required undue experimentation for a skilled artisan to make and use the claimed invention.

With regard to claims drawn to a method of treating or preventing hepatitis C virus infection in a subject using an agent that is **a nucleic acid**, the instant specification fails to disclose any component present in a nucleic acid to be utilized in the claimed method, let alone providing any specifics on the used nucleic acid. The specification does not teach which specific promoter or enhancer used, which DNA sequence encoding for which polypeptide or protein utilized, which particular vector deployed, the dosage of a nucleic acid used, the route of delivery or the regimens used to achieve any therapeutic effect or result as contemplated by the method as claimed. The nature of the claims would fall within the realm of gene therapy which at the filing date of the present application was still considered to be immature and highly unpredictable. In a meeting report on a workshop for gene therapy and translational cancer research (Clin. Cancer Res. 5:471-474, 1999), Dang et al. noted that "This workshop reviewed some recent advances in gene delivery, gene expression, immune manipulation, and the development of molecular targets and stressed that all of these **fields will need further advancement to make gene therapy a reality**." (page 471, column 1, last sentence of first paragraph). There are several factors known to limit an effective gene therapy, including the sub-optimal vectors, the lack of long-term and stable *in vivo* transgene expression, and most importantly an effective *in vivo* gene delivery to targeted cells or tissues. In a recent review on gene delivery systems for both viral and non-viral vectors (Hematol. Oncol. Clin. North Am. 12:483-501, 1998),

Wivel & Wilson stated that "One of the major challenges still confronting the field is the design of more efficient vectors. The gene delivery systems being used today will undoubtedly be seen as crude when compared with future developments. It is unlikely that there will ever be a universal vector, but rather there will be multiple vectors specifically designed for certain organ sites and certain diseases....It will be necessary to do much more fundamental research in cell biology, virology, immunology, and pathophysiology before vectors can be significantly improved." (pages 498-499 in Summary section). Given the lack of guidance provided by the specification regarding to the make and use of a more efficient expression recombinant vector over those already known in the art, it would have required undue experimentation without a predictable expectation of success for one skilled in the art to express an effective *in vivo* level of a polypeptide or a protein encoded by a nucleic acid to bind to the HCV E2 protein and in effect inhibiting the attachment of HCV onto cells, and thereby treating or preventing HCV infection in a subject. The claims also encompass any and all polypeptide or protein encoded by a nucleic acid that is capable of binding to HCV envelope E2 protein. Factors such as the level of mRNA produced, the stability and the proper compartmentalization of the recombinant polypeptide or protein produced, may differ dramatically depending on which recombinant molecule being produced. The level of gene expression, its duration and its *in vivo* effects are not always predictable and these can not be overcome by routine experimentation. With the lack of guidance provided by the instant specification, again it would have required undue experimentation without a predictable expectation of success for one skilled artisan to

make and use the method as claimed. Furthermore, vector targeting *in vivo* to desired cells or tissues continues to be unpredictable and inefficient. This is supported by numerous teachings in the art. Deonarain (Exp. Opin. Ther. Patents 8:53-69, 1998) indicated that one of the main obstacles hampering a successful gene therapy is the "ability to target a gene to a significant population of cells and express it at adequate levels for a long enough period of time." (page 53, first paragraph). Deonarain also reviewed new techniques under experimentation in the art which show promises. One of which is the ligand-targeted receptor-mediated vector approach with a relatively higher level of tissue specificity than viruses can offer. However, this approach to gene therapy is much less efficient than viral gene delivery (column 1, last paragraph, page 65). Verma & Somia (Nature 389:239-242,1997) reviewed various vectors known in the art for use in gene therapy, and the problems which are associated with each. They also indicated clearly that resolution to vector targeting had not been achieved in the art (see the entire article). Verma & Somia discussed the role of the immune system in inhibiting the efficient targeting of viral vectors such that an efficient expression is not achieved (see page 239, and second and third columns of page 242). Verma & Somia also indicated that appropriate enhancer-promoter sequences can improve expression, but that the "search for such combinations is a case of trial and error for a given cell type." (page 240, sentence bridging columns 2 and 3). Against this background, the specification fails to provide sufficient guidance for a skilled artisan how to overcome the unpredictability of vector targeting *in vivo* known in the art, such that an efficient transfer and expression of a transgene, for this instance a polypeptide or a protein that is

capable of binding to HCV envelope E2 protein, could be achieved by any and all modes of delivery to the liver cells to treat or prevent HCV infection as claimed. Therefore, it would have required undue experimentation without a predictable expectation of success for a skilled artisan to make and use the claimed invention.

With respect to claims directed to a method of treating or preventing HCV infection in a subject using an agent that inhibits the attachment of HCV onto cells, and wherein the agent is a **pseudo enzyme**, a **peptidomimetic compound**, an **antibody or its variant** thereof, similar concerning issues stated above are equally applicable. The instant specification is completely silent on which pseudo enzyme, which peptidomimetic compound, which antibody or its variant being utilized, specific conditions or parameters used to achieve any therapeutic effect or result as claimed. In the absence of any teachings regarding the critical elements for the claimed method, and particularly these critical elements are not conventional in the prior art at the filing date of the present application, it would naturally require undue experimentation without a predictable expectation of success for one skilled in the art to make and use the claimed invention.

Accordingly, due to the lack of direction or guidance provided by the specification, the state of the art at the effective filing date of the present application, the unpredictability of the physiological and gene therapy arts, and the breadth of the claims, it would have required undue experimentation without a predictable degree of success for one skilled in the art to make and use the instantly claimed invention.

Conclusions

Claims 1-11 are free of prior art. At the time of the instant invention, the prior art did not teach or fairly suggest a method of treating or preventing hepatitis C virus infection in a subject using an effective amount of an agent that is capable of inhibiting the attachment of hepatitis C onto cells by specifically binding to the hepatitis C virus envelope E2 protein as claimed.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang Nguyen, Ph.D., whose telephone number is (703) 308-8339.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's mentor, Dave Nguyen, may be reached at (703) 305-2024, or SPE, Karen Hauda, at (703) 305-6608.

Any inquiry of a general nature or relating to the status of this application should be directed to Patent Analyst, Patsy Zimmerman, whose telephone number is (703) 305-2758.

To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Group Art Unit 1632.

Papers related to this application may be submitted to Group 160 by facsimile transmission. Papers should be faxed to Group 160 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15,1989). The CM1 Fax Center number is or (703) 305-3014 or (703) 308-4242.

Quang Nguyen, Ph.D.

Primary Examiner
AU 1633